

CANDIDATE AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Etheostoma nigrum susanae

COMMON NAME: Cumberland johnny darter

LEAD REGION: 4

INFORMATION CURRENT AS OF: January 5, 2001

STATUS/ACTION (Check all that apply):

☐ New candidate

☒ Continuing candidate

☒ Non-petitioned

☐ Petitioned - Date petition received: ____

☐ No finding yet

☐ 90-day positive - FR date: ____

☐ 12-month warranted but precluded - FR date: ____

☐ Is the petition requesting a reclassification of a listed species?

☐ Listing priority change

Former LP: ____

New LP: ____

☐ Candidate removal: Former LP: ____ (Check only one reason)

☐ A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

☐ F - Range is no longer a U.S. territory.

☐ M - Taxon mistakenly included in past notice of review.

☐ N - Taxon may not meet the Act's definition of "species."

☐ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Fishes - Percidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Kentucky, Tennessee

CURRENT STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Kentucky, Tennessee

LEAD REGION CONTACT (Name, phone number): Lee Andrews, 404/679-7217

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Asheville, North Carolina Field Office, John Fridell, 828/258-3939, ext. 225

SUPPORT FIELD OFFICE(S): Cookeville, Tennessee Field Office

BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

The Cumberland johnny darter, Etheostoma nigrum susanae, is a small fish reaching about 12.7 centimeters (3 inches) in length. It has straw-yellow background body color with brown markings forming six, evenly-spaced, dorsal (back) saddles and a series of X-, M-, or W-shaped markings on its sides. During spawning season, the overall body color of breeding males darkens and the side markings become obscure or appear as a series of blotches (adapted from Etnier and Starnes 1993). Starnes and Starnes (1979) distinguished the Cumberland johnny darter from the johnny darter (E. nigrum) by the following characteristics: the top of head, opercles (gill coverings), and mid-belly of the Cumberland johnny darter are devoid of scales, and the pre-orbital stripe (a dark stripe extending from the eye to the upper lip) on the Cumberland johnny darter is usually interrupted at the nostrils (nares). Strange (1998) has recommended that the taxon be elevated to specific status based on the results of his mitochondrial DNA analysis of E. nigrum susanae and E. nigrum.

The Cumberland johnny darter is endemic to the upper Cumberland River system, above Cumberland Falls, Kentucky and Tennessee. It inhabits shallow water in low velocity shoals and backwater areas of moderate to low gradient stream reaches with stable sand or sandy-gravel substrata. The species is not found in areas with cobble or boulder substrata. All specimens that have been collected in recent years have been found in less than 15 centimeters (6 inches) of water (O'Bara 1988, Laudermilk and Cicerello 1998).

Though the Cumberland johnny darter was recorded as abundant by Jordan and Swain (1883), it is now considered to be rare and extremely restricted in range. Recent surveys by O'Bara (1988) and Laudermilk and Cicerello (1998) indicate that the Cumberland johnny darter is restricted to short reaches of 16 small streams in the upper Cumberland system in Whitley and McCreary counties, Kentucky, and only two small streams in Tennessee - one in Scott County and one in Campbell County. The species has apparently been extirpated from Little Wolf Creek, Whitley County, Kentucky, where it was recorded by Jordan and Swain (1883), and from Gum Fork, Scott County, Tennessee, where it was recorded by Shoup and Peyton (1940). Also, although O'Bara (1988) recorded the Cumberland johnny darter from two sites in the mainstem of the Cumberland River, recent efforts to recollect the species from these sites have been unsuccessful (Ron Cicerello, Kentucky Nature Preserves Commission, Frankfort, Kentucky, personal communication 1999). Previous records of the species in the Poor Fork portion of the Cumberland River drainage in Letcher and Harlan counties, Kentucky (Starnes and Starnes 1979), have been determined to be the johnny darter (E. nigrum) based a genetics study conducted Strange (1998). Records of the species from Martins Fork, Harlan County, Kentucky (Starnes and Starnes 1979), are also believed to be misidentifications; however, efforts to collect individuals from Martins Forks for genetic studies have been unsuccessful, indicating that whichever taxon occurred in this system has apparently been extirpated.

All 16 of the surviving occurrences of the Cumberland johnny darter are restricted to short stream reaches, with the majority believed to be restricted to less than 1.6 kilometers (1 mile) of stream.

These 16 occurrences are thought to form six population clusters that are isolated from one another by poor quality habitat, impoundments, or natural barriers.

THREATS (Describe threats in terms of the five factors in section 4 of the ESA providing specific, substantive information. **If this is a removal of a species from candidate status or a change in listing priority, explain reasons for change**):

- A. The present or threatened destruction, modification, or curtailment of its habitat or range. Siltation, primarily from coal mining activities, but also from forestry and agricultural activities, road construction, and urban development, appears to be the major factor contributing to the decline of the Cumberland johnny darter throughout its range and the most significant threat to the species continued existence (O'Bara 1988). The habitat in which the species is primarily found is extremely susceptible to the effects of siltation. The low to moderate gradient, low velocity, shallow depth, and backwater nature of this habitat leads to this susceptibility. O'Bara (1988) reported that only 15 of the 70 sites that he sampled for the Cumberland johnny darter had not been impacted by siltation associated with mining and other poorly implemented land disturbance activities.

Practices that affect sediment discharges into a stream system change the erosion or sedimentation pattern, which can lead to the destruction of riparian vegetation, bank collapse, and increased water turbidity and temperature. Excessive sediments are believed to impact the habitat of darters and associated fish species, by making it unsuitable for feeding and reproduction. Sediment has been shown to abrade and or suffocate periphyton, disrupt aquatic insect natural processes, and, ultimately, negatively impact fish growth, survival, and reproduction (Waters 1995).

- B. Overutilization for commercial, recreational, scientific, or educational purposes. The specific areas inhabited by the Cumberland River johnny darter are not presently known to the general public, and, until a proposed rule is published, the public will be unaware of this fish's presence in the upper Cumberland River system. As a result, take of the Cumberland johnny darter by the general public has not been a problem. However, this fish exists only in small, restricted areas. Once its rarity becomes known, it may become attractive to collectors. Although scientific collecting is not presently identified as a threat, take by private and institutional collectors could pose a threat. Federal protection could help to reduce the negative impact of illegal or inappropriate take.
- C. Disease or predation. Although the Cumberland johnny darter is undoubtedly consumed by predators, predation by naturally occurring predators is a normal aspect of the population dynamics and is not considered to currently pose a threat to the species. To the extent that disease or predation occurs, it becomes a more important consideration as the total population decreases in number.
- D. The inadequacy of existing regulatory mechanisms. The Cumberland johnny darter does not currently have any official status in the State of Tennessee. Also, while the species

does not currently have any official status in the State of Kentucky, the Kentucky Nature Preserves Commission considers the species to be endangered within the State (Cicerello, personal communication 1999).

Both Tennessee and Kentucky prohibit the collection of the fish for scientific purposes without a valid State collecting permit. However, this requirement does not provide any protection to the species' habitat.

In seven of the streams where the Cumberland johnny darter still occurs, the species is indirectly provided some Federal protection from Federal actions and activities through the Endangered Species Act, due to the fact that these seven streams also support the blackside dace (Phoxinus cumberlandensis), federally listed as threatened. Also, one of these seven streams, Marsh Creek, supports an occurrence of the Cumberland elktoe mussel (Alasmodonta atropurpurea), federally listed as endangered. However, the nine other streams supporting surviving occurrences of the Cumberland johnny darter are not afforded this protection. Federal listing would provide additional protection for the Cumberland johnny darter throughout its range by requiring Federal permits in order to take the species and by requiring Federal agencies to consult with the Service when activities they fund, authorize, or carry out may affect the species.

- E. Other natural or manmade factors affecting its continued existence. The existing Cumberland johnny darter populations are small in size and range, and are geographically isolated from one another. This patchy distribution pattern of populations in short stream reaches and small population size makes them much more susceptible to extirpation from single catastrophic events (such as toxic chemical spills). It also reduces their ability to recover from smaller impacts to their habitat or population size. Furthermore, this level of isolation makes natural repopulation of any extirpated population impossible without human intervention.

Population isolation also prohibits the natural interchange of genetic material between populations, and small population size reduces the reservoir of genetic diversity within populations. This can lead to inbreeding depression (Avice and Hambrick 1996). It is likely that some of the Cumberland johnny darter populations are below the effective population size (Soule 1980) required to maintain long-term genetic and population viability.

SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

FOR RECYCLED PETITIONS:

- a. Is listing still warranted? ____
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? ____
- c. Is a proposal to list the species as threatened or endangered in preparation? ____

- d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

LAND OWNERSHIP (Percentage Federal/state/private, identify nonprivate owners): The watersheds of the streams that still support populations of the Cumberland johnny darter are roughly 60 percent in private ownership and 40 percent public (the U.S. Forest Service's Daniel Boone National Forest). However, with the exception of Bunches Creek, Whitley County, Kentucky, which is primarily (about 90 percent) within the Daniel Boone National Forest, in most cases where portions of the streams' watersheds are within the boundaries of the National Forest, the U.S. Forest Service ownership is fragmented and often occurs on only one side of the stream.

PRELISTING (Describe status of conservation agreements or other conservation activities): There are no written agreements currently in place for this species or its habitat. The Service has been working with biologists with the U.S. Forest Service, and the States of Kentucky and Tennessee, as well as personnel with the University of Tennessee, Knoxville, Tennessee, to identify threats and potential recovery measures for the Cumberland johnny darter.

The Service has also contacted resource managers with the U.S. Geological Survey, Environmental Protection Agency, Tennessee Valley Authority, State Natural Heritage Programs, Kentucky State Nature Preserves Commission, and Tennessee and Kentucky State Fish and Wildlife Agencies to make them aware of our proposal to elevate the Cumberland johnny darter to candidate status. These agencies and organizations all indicated support for elevation of the species to candidate status.

REFERENCES (Identify primary sources of information (e.g., status reports, petitions, journal publications, unpublished data from species experts) using formal citation format):

Awise, J.C. and J.L. Hambrick, eds. 1996. Conservation genetics: case histories from nature. Chapman and Hall, New York.

Etnier, D.A. and W.C. Starnes. 1993. Etheostoma nigrum Rafinesque Johnny darter. Pages 510-512 In: The Fishes of Tennessee. The Univ. Of Tennessee Press.

Jordan, D.S. and J. Swain. 1883. List of fishes collected in the Clear Fork of the Cumberland, Whitley County, Kentucky, with descriptions of three new species. Proc. U.S. Nat. Mus. 6:248-251.

Laudermilk, E.L. and R.R. Cicerello, Compilers. 1998. Upper Cumberland River Drainage, Kentucky Fish Collection Catalog (1982-1994). Kentucky State Nature Preserves Commission. 469 pp.

O'Bara, C.J. 1988. Current distribution, habitat requirements and potential threats of the upper Cumberland River johnny darter Etheostoma nigrum susanae. Unpublished report to the U.S. Fish and Wildlife Service, Asheville, North Carolina. 19 pp.

- Shoup, C.S. and J.H. Peyton. 1940. Collection from the drainage of the Big South Fork of the Cumberland River in Tennessee. *Journal of the Tennessee Academy of Science* 15:106-116.
- Soule, M.E. 1980. Threshold for survival: maintaining fitness and evolutionary potential. Pages 151-169 In: M.E. Soule and B.A. Wilcox, eds. *Conservation biology*. Sinauer Associates, Inc., Sunderland, Massachusetts.
- Starnes, W.C. and L.B. Starnes. 1979. Taxonomic status of the percid fish, Etheostoma nigrum susanae. *Copeia* 1979:426-430.
- Strange, R.M. 1998. Analysis of a putative hybrid zone between Etheostoma susanae and E. nigrum in the Poor Fork of the Cumberland River, Eastern Kentucky. Final report to United States Department of the Interior, Fish and Wildlife Service, Asheville, NC. 9 pp.
- Waters, T. F. 1995. Sediment in streams: sources, biological effects and control. *Am. Fish. Soc. Mono.* 7. Bethesda, MD. 251 pp.

LISTING PRIORITY (place * after number)

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6*
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, annual retentions of candidates, removal of candidates, and listing priority changes.

Approve: _____
Regional Director, Fish and Wildlife Service Date _____

Concur: _____
Director, Fish and Wildlife Service Date _____

Do not concur: _____
Director, Fish and Wildlife Service Date _____

Director's Remarks: _____

Date of annual review: January 17, 2001

Conducted by: Allen Ratzlaff - Asheville, North Carolina FO

Changes from October 25, 1999 CNOR(check one) Yes X No

Approval: _____
Regional Director Dated _____

Comments: _____

(rev. 6/00)